

Title (en)

Fluid cooled encapsulated microelectronic package

Title (de)

Eingekapseltes flüssigkeitsgekühltes mikroelektronisches Gehäuse

Title (fr)

Boîtier micro-électronique encapsulé refroidi par un fluide

Publication

EP 1628345 A2 20060222 (EN)

Application

EP 05076743 A 20050728

Priority

US 91962504 A 20040817

Abstract (en)

An encapsulated microelectronic package includes a fluid conducting cooling tube (22) directly coupled to one or more semiconductor chips (12, 14, 16), with the encapsulant (34) being molded over the semiconductor chips (12, 14, 16) and portions of the cooling tube (22) in proximity to the semiconductor chips (12, 14, 16). The encapsulant (34) immobilizes the cooling tube (22) with respect to the semiconductor chips (12, 14, 16), and the cooling tube (22) and encapsulant (34) are designed to minimize differences in their coefficients of thermal expansion relative to the semiconductor chips (12, 14, 16).

IPC 8 full level

H01L 23/473 (2006.01)

CPC (source: EP US)

H01L 23/473 (2013.01 - EP US); **H01L 2224/16** (2013.01 - EP US); **H01L 2224/73253** (2013.01 - EP US); **H01L 2924/00011** (2013.01 - EP US); **H01L 2924/00014** (2013.01 - EP US); **H01L 2924/13055** (2013.01 - EP US); **H01L 2924/13091** (2013.01 - EP US)

Citation (applicant)

- US 5276586 A 19940104 - HATSUDA TOSHIO [JP], et al
- US 5349237 A 19940920 - SAYKA ANTHONY [US], et al
- US 5696405 A 19971209 - WELD JOHN DAVID [US]
- US 6600651 B1 20030729 - WENG CHUN-JEN [TW]
- JP 2002270748 A 20020920 - HITACHI LTD
- JP H0451550 A 19920220 - HITACHI LTD
- US 5150274 A 19920922 - OKADA KENICHI [JP], et al
- US 4178630 A 19791211 - OLSSON KARL E [SE]

Designated contracting state (EPC)

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DOCDB simple family (publication)

EP 1628345 A2 20060222; **EP 1628345 A3 20060329**; **EP 1628345 B1 20170118**; US 2006038284 A1 20060223; US 2007114656 A1 20070524; US 2009108439 A1 20090430; US 2012001319 A1 20120105; US 7205653 B2 20070417; US 7485957 B2 20090203; US 8026597 B2 20110927; US 8471380 B2 20130625

DOCDB simple family (application)

EP 05076743 A 20050728; US 201113229077 A 20110909; US 31698208 A 20081217; US 65431807 A 20070117; US 91962504 A 20040817